CLAIMS

What is claimed is:

1. A burst mode receiver comprising:

a converter which converts a received optical signal into an electrical signal;

a pre-amplifier coupled to the converter, which receives the electrical signal from the converter and outputs a corresponding voltage signal, the voltage signal having a driven edge time constant for each driven edge of the electrical signal and an undriven edge time constant that is extended and longer than the driven edge time constant for each undriven edge of the electrical signal; and

a differential amplifier having a hysteresis circuit coupled to the pre-amplifier, the differential amplifier receiving the voltage signal from the pre-amplifier and outputting a digital signal corresponding to the voltage signal, wherein the hysteresis circuit holds the digital signal in a particular state for each undriven edge of the voltage signal and changes the state of the digital signal for each driven edge of the voltage signal.

2. The burst mode receiver of Claim 1 wherein the optical signal includes a plurality of packets transmitted in burst mode and the undriven edge time constant is shorter than a guard time between packets.

3. The burst mode receiver of Claim 1 wherein the optical signal includes a plurality of packets transmitted in continuous mode.

4. The burst mode receiver of Claim 2 wherein the packets have a wide dynamic range of power levels.

5. The burst mode receiver of Claim 3 wherein the power level is in the range -32dBm to -7dBm

6. The burst mode receiver of Claim 1 further comprising a filter coupled between the pre-amplifier and the differential amplifier.

7. The burst mode receiver of Claim 1 wherein the optical signal is received from a transmitter in a Passive Optical Network.

8. A method of receiving an optical signal comprising:

converting an optical signal to an electrical signal;

AC-coupling the electrical signal to provide an AC-coupled signal;

outputting a voltage signal corresponding to the AC-coupled signal, the voltage signal having a driven edge time constant corresponding to each driven edge of the AC-coupled signal and an undriven edge time constant extended and longer than the driven edge time constant corresponding to each undriven edge of the AC-coupled signal; and

outputting a digital signal corresponding to the voltage signal, the digital signal holding a particular state for each undriven edge of the voltage signal and changing state for each driven edge of the voltage signal.